Accelerated Training Program (ATP) Presentation:

Contributions to the Internet Protocols Testbed

3/26/96

Jim Griner

Outline

- Why BSD? (Berkley Software Distribution UNIX)
- NetBSD
- FreeBSD
- Internet Protocols Testbed Setup

Why BSD?

- The de facto standard for TCP/IP (Internet Protocols) implementations is from the Computer Systems Research Group at the University of California at Berkley, which is distributed with the 4.x BSD system
- 4.2BSD was the first widely available release of TCP/IP

Why BSD?

- The standard TCP stack makes 4BSD UNIX the TCP researcher's preferred Operating System.
- 4BSD is in all modern implementations of UNIX
- Source code for standard TCP version and proposed changes are freely available

NetBSD

- Pros
  - Can be ported to several different architectures (DEC Alpha, Amiga, Atari, i386-family, Macintosh, PowerPC, Sun SPARC, etc.
- Cons
  - Not easy to install
  - Is not yet ported to Sun Ultras

NetBSD Installation

- Floppy Drive Installation Necessary
- Hard Drive Partitioning/Labeling Problems
- Device Driver Configuration Problems

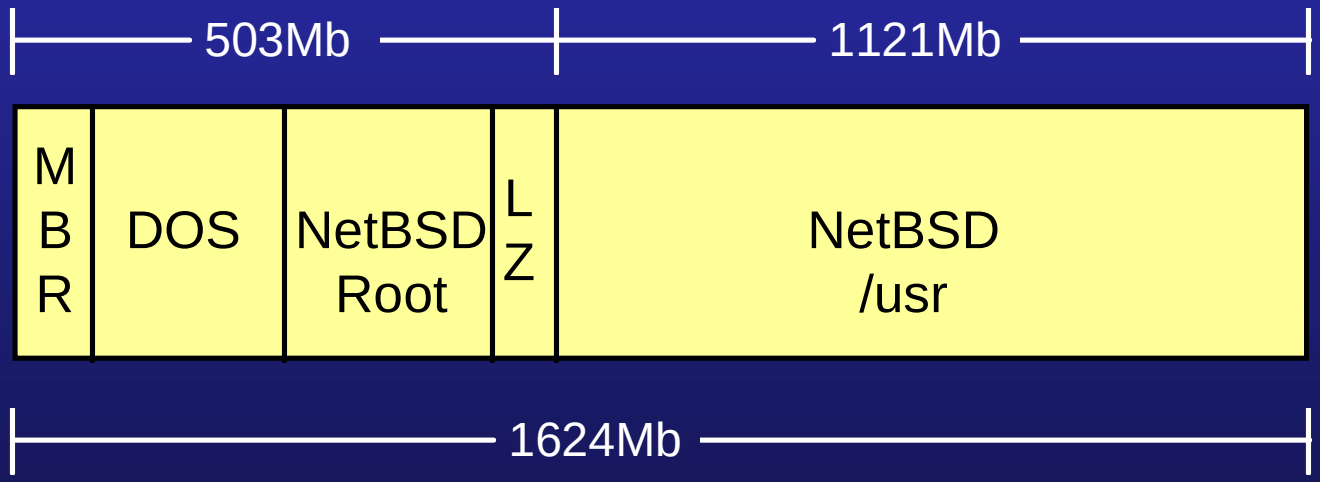
Floppy Drive Installation (1)

- Create Kernel Boot Floppy (1)
- Create Installation Floppy (1)
- Copy binary distribution sets (18)
- Partition Hard Drive
- Label Hard Drive partitions
- Boot Kernel Floppy
- Replace with Installation Floppy

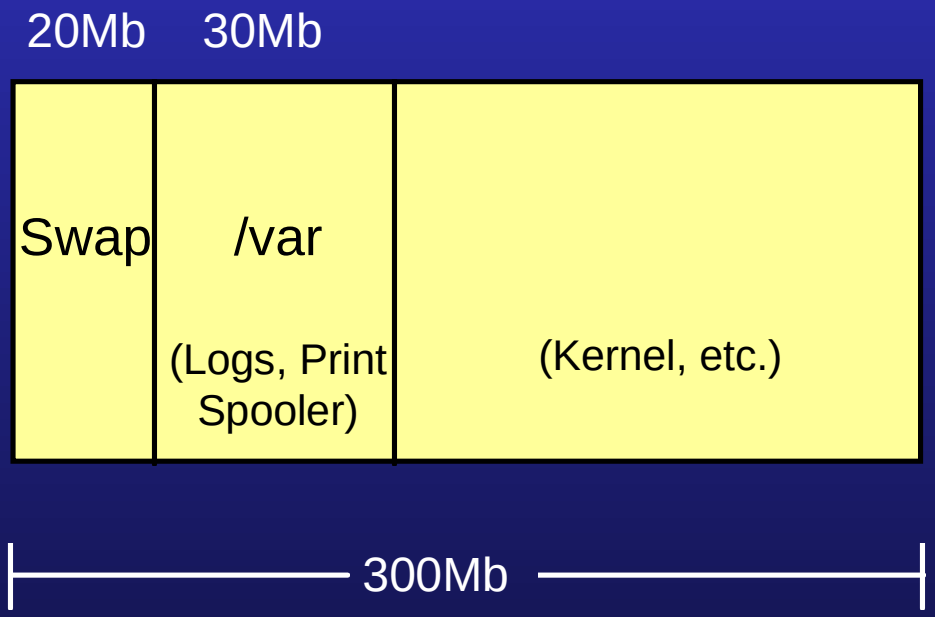
Floppy Drive Installation (2)

- Start Installation
- Input Hard Drive Parameters
- Reboot Kernel Floppy
- Copy Kernel from floppy to Hard Drive
- Reboot to NetBSD on Hard Drive
- Extract binary distribution sets
- Reboot

Hard Drive Geometry



NetBSD Root Partition



NetBSD

FreeBSD

FreeBSD

- Pros
  - Easier Installation
- Cons
  - Only available on i386-family architectures

FreeBSD Installation

- CD-ROM Installation
- Hard Drive Partitioning/Labeling Tool
- Device Driver Setup Menu

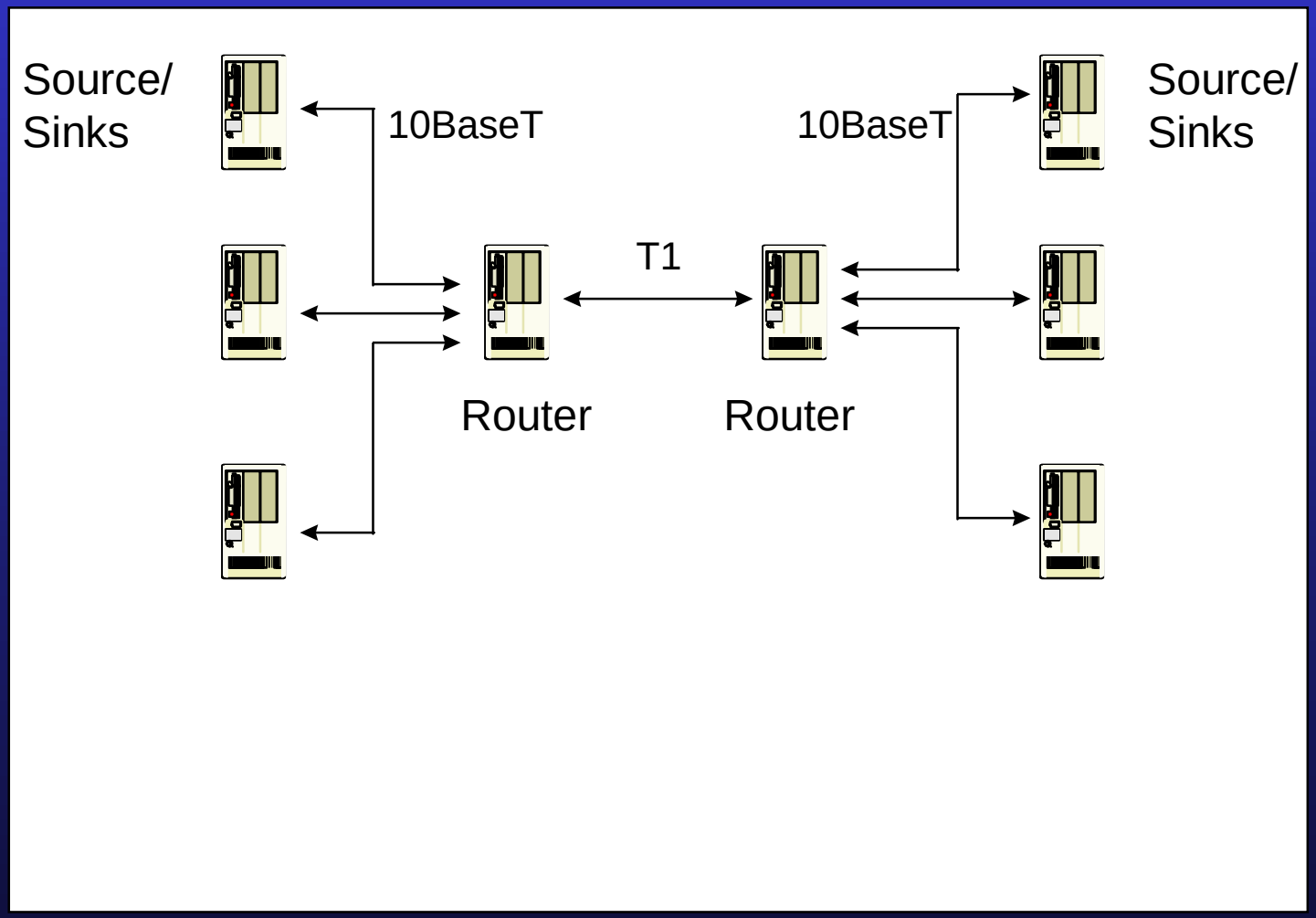
CD-ROM Installation

- Create bootable floppy with CD-ROM drivers
- Run install program on CD-ROM
- Change Hard Drive Partition information
- Change Hard Drive Partition Labels
- Select Binary distributions to install
- Reboot

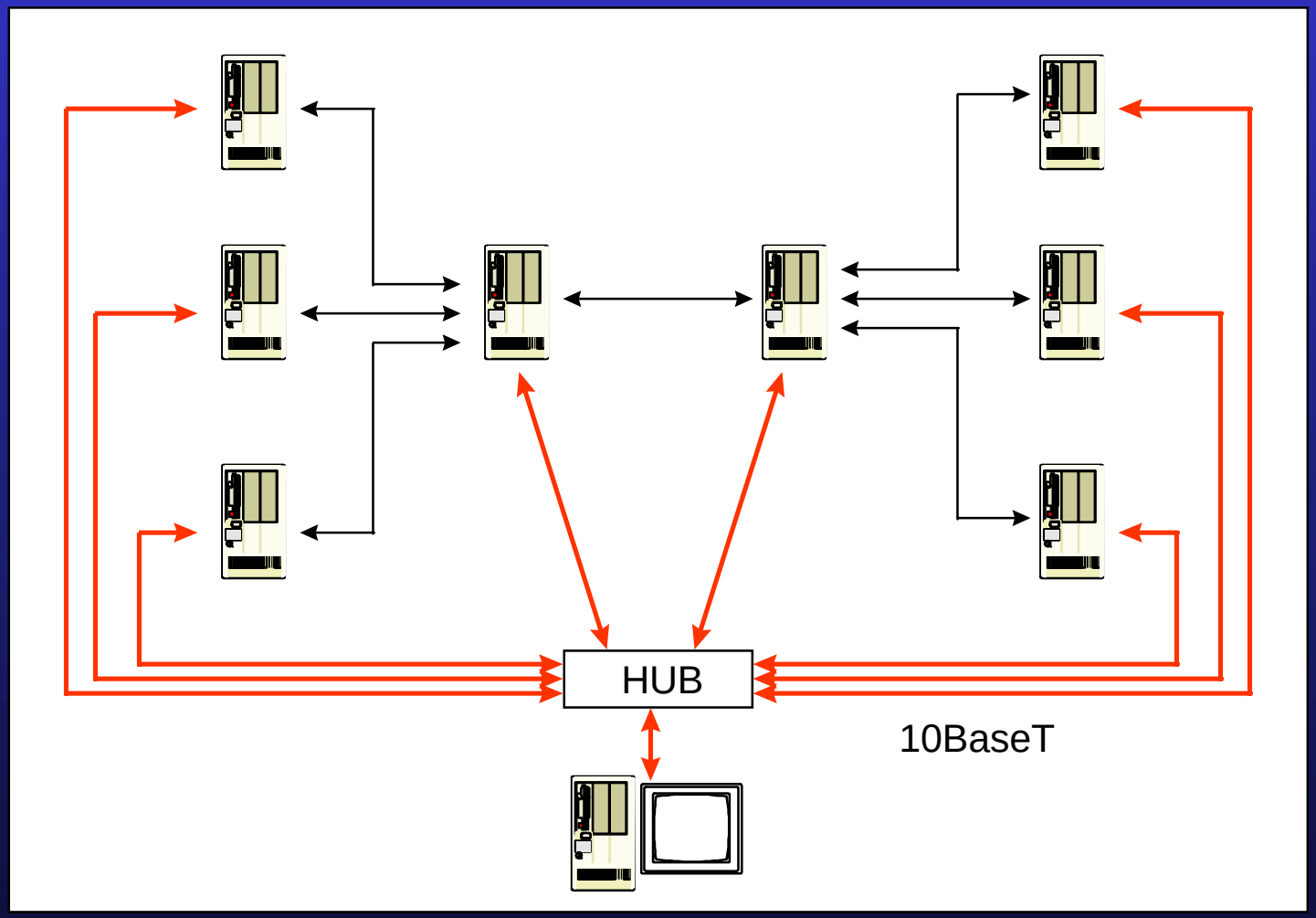
Internet Protocols Testbed

- Equipment
  - 9 Pentium Pro computers
  - 24 Ethernet cards
  - 1 Hub
- Running FreeBSD with University of Southern California's network emulator software and tcplib (traffic generation software)

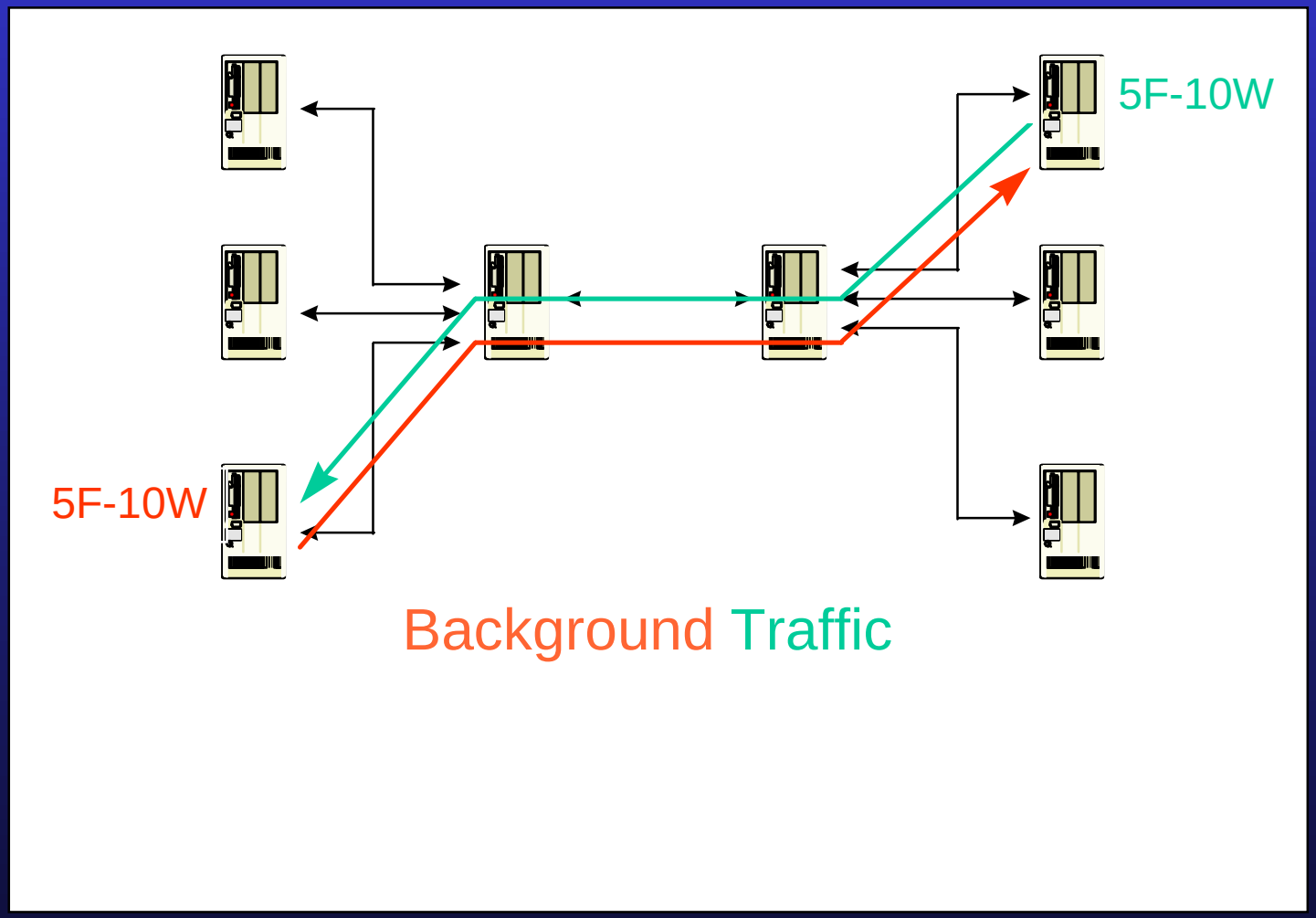
Internet Protocols Testbed



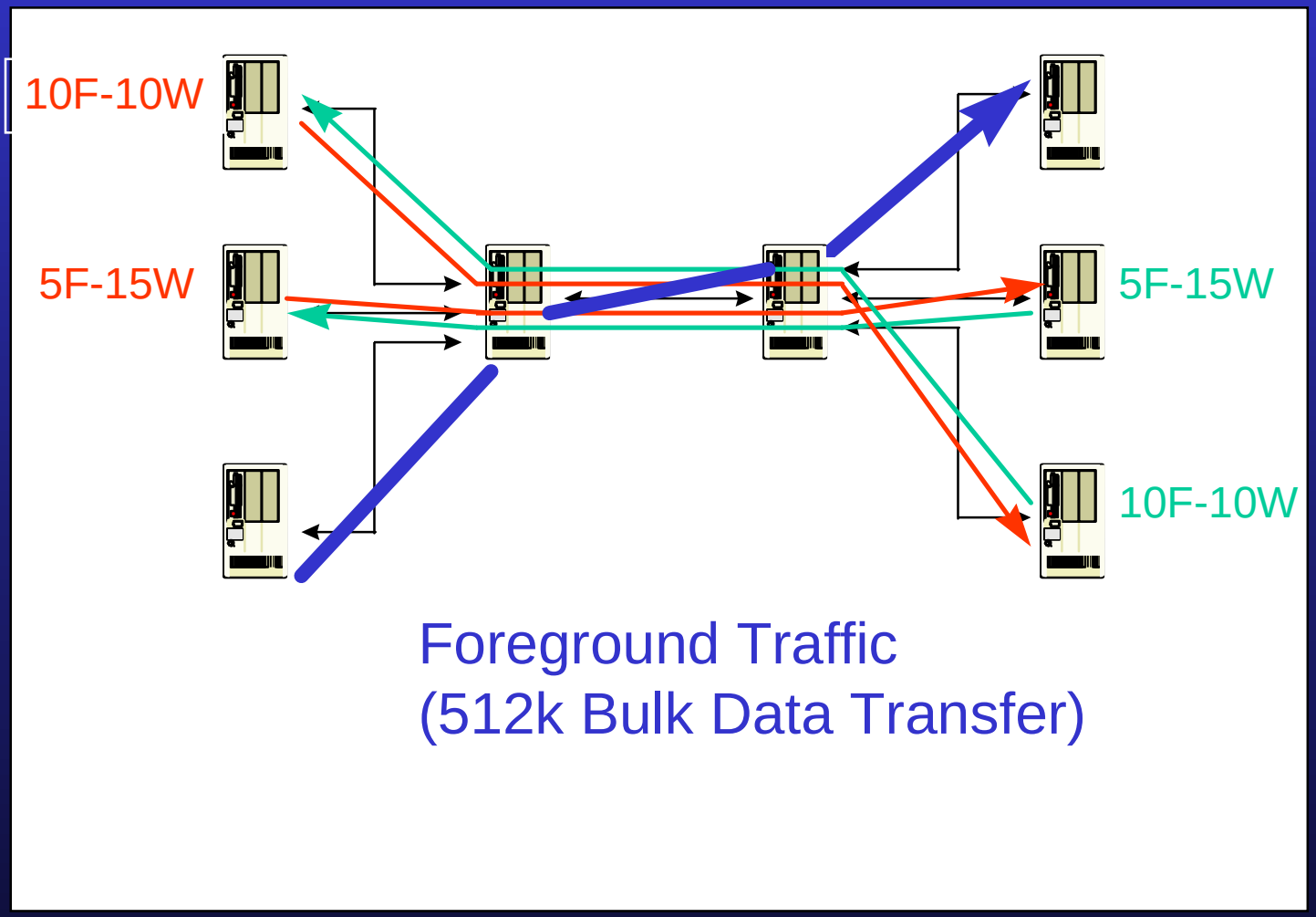
Internet Protocols Testbed



Internet Protocols Testbed



Internet Protocols Testbed



Traffic Scenarios

- 5F_10W = 5 flows of FTP and 10 flows of Web
- 5F_15W
- 10F_10W
- 10F_15W
- 10F_21W
- 10F_27W

TCP Versions

- Tahoe
- Reno
- Reno w/ SACK
- Vegas
- Janey Hoe
- 4k-Window

Goal

Recommend a TCP configuration that is satellite, as well as terrestrially-friendly

Timeframe

- PR started this week
- Equipment will hopefully arrive in June
- First results in July
- In the meantime, we are conducting simple experiments with Ohio University